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| 10/659,230 | 09/10/2003 | Tom Weidner | P03,0361 | 3480 |
| 26574 | 7590 | 01/23/2006 | EXAMINER | |
| SCHIFF HARDIN, LLP PATENT DEPARTMENT 6600 SEARS TOWER CHICAGO, IL 60606-6473 | | | SWERDLOW, DANIEL | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 2646 | |

DATE MAILED: 01/23/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/659,230

Applicant(s)

WEIDNER, TOM

Examiner

Daniel Swerdlow

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2646

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 September 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-69 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-69 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 10 September 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
- Paper No(s)/Mail Date _____.

- 4) ☐ Interview Summary (PTO-413)
- Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claims

1. Although no rejections or objections are made on this basis, it appears that applicant intends Claim 48 to depend from Claim 45 instead of Claim 42, as presented. Similarly it appears that applicant intends Claim 67 to depend from Claim 66 instead of Claim 61, as presented.
2. In addition, it appears the recitation "feedback-limiting filter" in the second line of Claim 24 is intended as --frequency-limiting filter--.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1 through 12, 14 through 47 and 49 through 69 are rejected under 35 U.S.C. 102(e) as being anticipated by Kates (US Patent 6,831,986).
5. Regarding Claim 1, Kates discloses a feedback cancellation (i.e., a feedback compensator) for use in a hearing aid (i.e., an acoustic amplification system) (Fig. 4) comprising: an adaptive filter 401 that corresponds to the adaptive feedback compensation filter claimed and generates a compensation signal $v(n)$ from the amplified output signal 425, the compensation signal $v(n)$ being combined with the input signal $s(n)$ in summing junction 409; and adaptive

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frequency select (i.e., frequency limiting) filters 419, 421 and 423 any one of which corresponds to the frequency limiting filter claimed and is connected relative to the adaptive filter 401 that corresponds to the adaptive feedback compensation filter claimed, limits the frequency range within which the compensation filter compensates feedback (column 3, lines 30-34) and is adaptable during compensation (column 8, lines 30-51).

6. Regarding Claim 2, Kates further discloses the adaptive frequency select (i.e., frequency limiting) filters 421, 423 comprised of a plurality of individual filters (Figs. 6-9).

7. Regarding Claim 3, Kates further discloses selection of individual bandpass filters by adjustment of cascaded individual notch filters (Fig. 8, reference 801, 803, 805, 807; column 10, lines 40-45).

8. Regarding Claim 4, Kates further discloses the adaptive frequency select (i.e., frequency limiting) filters 421, 423 emphasizing a frequency region with the greatest stability problems (i.e., cover the feedback frequency range) (column 3, lines 30-33).

9. Regarding Claim 5, Kates further discloses the adaptive frequency select (i.e., frequency limiting) filters 421, 423 having coefficients adapted to modify the filter function (column 8, lines 59-65).

10. Regarding Claim 6, Kates further discloses the amplified output signal 425 supplied to the LMS adapter 403 of the adaptive filter 401 that corresponds to the adaptive feedback compensation filter claimed through the frequency select (i.e., frequency limiting) filter 423.

11. Regarding Claim 7, Kates further discloses adapting the frequency select (i.e., frequency limiting) filters 421, 423 according to a sequence that inherently requires a controller (Fig. 5; column 8, lines 52-54).

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12. Regarding Claim 8, Kates further discloses selection of individual bandpass filters by adjustment of cascaded individual notch filters (Fig. 8, reference 801, 803, 805, 807; column 10, lines 40-45) that correspond to the changeover switch claimed.

13. Regarding Claim 9, Kates further discloses the adaptive frequency select (i.e., frequency limiting) filters 421, 423 having coefficients adapted to modify the filter function (column 8, lines 59-65).

14. Regarding Claim 10, Kates further discloses adapting the frequency select (i.e., frequency limiting) filters 421, 423 by analyzing an error signal (Fig. 5, step 507) that corresponds to the feedback compensated input signal claimed according to a sequence that inherently requires an analysis unit (Fig. 5; column 8, lines 52-54).

15. Regarding Claim 11, Kates further discloses adapting the frequency select (i.e., frequency limiting) filters 421, 423 by analyzing an error signal (Fig. 5, step 507) that corresponds to the filter parameter claimed (Fig. 5; column 8, lines 52-54).

16. Regarding Claim 12, Kates further discloses cross correlating (i.e., comparing) filtered output signal $f(n)$ and filtered input signal $g(n)$ to determine adaptive filter updating (Fig. 5, steps 509, 511; column 9, lines 7-11).

17. Regarding Claim 14, Kates further discloses an acoustic feedback path (Fig. 4, reference 417; column 8, lines 1-2).

18. Regarding Claim 15, while Kates is silent as to the susceptibility of the input signal to electromagnetic feedback, the mere existence of such a susceptibility of the input signal is not limiting on the structure of the feedback compensator absent any recitation in the claim that the

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feedback compensator acts on the electromagnetic feedback. As such, Claim 15 is rejected on the same grounds as Claim 1.

19. Regarding Claim 16, Kates further discloses an LMS adaptation unit (Fig. 4, reference 403; column 8, lines 35-38) that corresponds to the adaptation unit claimed dependent on a filtered error signal $g(n)$ and filtered feedback path signal $f(n)$ (i.e., a signal within the acoustic amplification system).

20. Regarding Claims 17 and 18, Kates further discloses an LMS adaptation unit (Fig. 4, reference 403; column 8, lines 35-38) that corresponds to the adaptation unit claimed dependent on a filtered error signal $g(n)$.

21. Regarding Claim 19, Kates further discloses adapting the filter 421 that produces the filtered error signal $g(n)$ (Fig. 5, step 503; column 8, lines 56-59).

22. Regarding Claim 20, Kates further discloses adapting the frequency select (i.e., frequency limiting) filters 421, 423 according to a sequence that inherently requires a controller (Fig. 5; column 8, lines 52-54).

23. Regarding Claim 21, Kates further discloses selection of individual bandpass filters by adjustment of cascaded individual notch filters (Fig. 8, reference 801, 803, 805, 807; column 10, lines 40-45) that correspond to the changeover switch claimed.

24. Regarding Claim 22, Kates further discloses the adaptive frequency select (i.e., frequency limiting) filters 421, 423 having coefficients adapted to modify the filter function (column 8, lines 59-65).

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25. Regarding Claim 23, Kates further discloses the LMS adaptation unit (Fig. 4, reference 403; column 8, lines 35-38) that corresponds to the adaptation unit claimed receives output $f(n)$ of the frequency select (i.e., frequency limiting) filter 423.

26. Regarding Claim 24, Kates further discloses the LMS adaptation unit (Fig. 4, reference 403; column 8, lines 35-38) that corresponds to the adaptation unit claimed receives output $g(n)$ of the frequency select (i.e., further frequency limiting) filter 421.

27. Regarding Claim 25, Kates further discloses the adaptive frequency select (i.e., frequency limiting) filters 421, 423 having coefficients adapted to modify the filter function (column 8, lines 59-65).

28. Regarding Claim 26, Kates further discloses adapting the frequency select (i.e., frequency limiting) filters 421, 423 according to a sequence that inherently requires a controller (Fig. 5; column 8, lines 52-54).

29. Regarding Claim 27, Kates further discloses selection of individual bandpass filters by adjustment of cascaded individual notch filters (Fig. 8, reference 801, 803, 805, 807; column 10, lines 40-45) that correspond to the changeover switch claimed.

30. Regarding Claim 28, Kates further discloses the adaptive frequency select (i.e., frequency limiting) filters 421, 423 having coefficients adapted to modify the filter function (column 8, lines 59-65).

31. Regarding Claim 29, Kates further discloses a so-called frozen filter 419 that corresponds to the first frequency-limiting filter claimed and wherein the LMS adaptation unit 403 that corresponds to the adaptation unit claimed receives the input signal $e(n)$ through a frequency select filter 421 that corresponds to the second frequency-limiting filter claimed and receives the

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output of the so-called frozen filter 419 that corresponds to the first frequency-limiting filter claimed through a frequency select filter 423 that corresponds to the third frequency-limiting filter claimed. Kates teaches adaptation of the so-called frozen filter 419 at column 8, lines 16-29.

32. Regarding Claim 30, Kates further discloses coefficients are copied from the frequency select filter 421 that corresponds to the second frequency-limiting filter claimed to the frequency select filter 423 that corresponds to the third frequency-limiting filter claimed (Fig. 5, step 505; column 8, lines 62-65).

33. Regarding Claim 31, Kates further discloses the adaptive frequency select filters 421, 423 that correspond to the second and third frequency-limiting filters claimed having coefficients adapted to modify the filter function (column 8, lines 59-65).

34. Regarding Claim 32, Kates further discloses adapting the frequency select filters 421, 423 that correspond to the second and third frequency-limiting filters claimed by analyzing an error signal (Fig. 5, step 507) that corresponds to the feedback compensated input signal claimed according to a sequence that inherently requires an analysis unit (Fig. 5; column 8, lines 52-54).

35. Regarding Claim 33, Kates further discloses selection of individual bandpass filters by adjustment of cascaded individual notch filters (Fig. 8, reference 801, 803, 805, 807; column 10, lines 40-45) that correspond to the changeover switch claimed.

36. Regarding Claim 34, Kates further discloses the adaptive frequency select (i.e., frequency limiting) filters 421, 423 having coefficients adapted to modify the filter function (column 8, lines 59-65).

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37. Regarding Claim 35, Kates discloses a hearing aid (Fig. 4) comprising: a microphone 407 that corresponds to the input transducer claimed and produces an input signal $s(n)$ from an incoming acoustic signal $x(n)$; a hearing aid processing unit 411 that corresponds to the hearing aid signal processor claimed and produces an amplified output signal 425, the input signal being influenced by a feedback via a feedback path 417; an adaptive filter 401 that corresponds to the adaptive feedback compensation filter claimed and generates a compensation signal $v(n)$ that is combined with input signal $s(n)$ in summer 409; a so-called frozen filter 419 that corresponds to the frequency-limiting filter claimed, limits the frequency range within which the compensation filter compensates feedback (column 3, lines 30-34) and is adaptable during compensation (column 8, lines 16-29).

38. Claims 36 through 47 and 49 through 69 are essentially similar to Claims 1 through 12 and 14 through 34, respectively, and are rejected on the same grounds.

39. Regarding Claim 50, while Kates is silent as to the susceptibility of the input signal to electromagnetic feedback, the mere existence of such a susceptibility of the input signal is not limiting on the method of feedback compensation absent any recitation in the claim that the feedback compensation acts on the electromagnetic feedback. As such, Claim 50 is rejected on the same grounds as Claim 36.

Claim Rejections - 35 USC § 103

40. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

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having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

41. Claims 13 and 48 rejected under 35 U.S.C. 103(a) as being unpatentable over Kates in view of Weidner (US Patent 6,404,895).

42. Regarding Claims 13 and 48, as shown above apropos of the respective parent claims, Kates anticipates all elements except performing feedback analysis by measuring feedback with an oscillation detector. Weidner discloses use of an oscillation detector to detect feedback in a hearing aid (column 2, lines 62-67). Weidner further discloses that such an arrangement is especially useful where the feedback frequency is to be determined. It would have been obvious to one skilled in the art at the time of the invention to apply measuring feedback with an oscillation detector as taught by Weidner to the feedback compensation taught by Kates for the purpose of realizing the aforesaid advantage.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daniel Swerdlow whose telephone number is 571-272-7531. The examiner can normally be reached on Monday through Friday between 7:30 AM and 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sinh H. Tran can be reached on 571-272-7564. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Daniel Swerdlow
Examiner
Art Unit 2646

ds
12 January 2006